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IN RE RIYAD R. IRANI AND KURT MOEDRITZER

No. 8298

United States Court of Customs and Patent Appeals

57 C.C.P.A. 1109; 427 F.2d 806; 1970 CCPA LEXIS 346; 166 U.S.P.Q. (BNA) 24

Oral argument March 5, 1970

June 11, 1970

PRIOR HISTORY: [*1]**

Appeal from Patent Office, Serial No. 420,795

DISPOSITION:

Reversed.

COUNSEL:*Richard W. Sternberg, Roger R. Jones*, attorneys of record, for appellant.*Joseph Schimmel* for the Commissioner of Patents.
Jack E. Armore, of counsel.**OPINIONBY:**

RICH

OPINION: [806]**

[**1109] Before RICH, ALMOND, BALDWIN, LANE, Associate Judges, and ROSENSTEIN, Judge, sitting by designation.

RICH, Judge, delivered the opinion of the court:

This appeal is from a decision of the Patent Office Board of Appeals affirming the rejection of claim 1 of

application serial No. 420,795, filed December 23, 1964, entitled "Chemical Compound," stated to be a continuation-in-part of application serial No. 152,048, filed November 13, 1961. We reverse.

The appealed claim, the only claim in the application, reads:

1. Crystalline anhydrous amino tri (methylenephosphonic acid). [Emphasis added.]

This compound, which is sometimes hereinafter referred to as "ATMP," has the structural formula:

[Graphic omitted. See illustration in original.]
[**807]

The subscript "3" indicates that there are three methylenephosphonic acid radicals attached to the nitrogen atom. The application discloses [***2] that this compound is useful as "a sequestering agent, deflocculating agent, detergent builder and the like."

[**1110] The reference relied on are:

Kosolapoff, *Organophosphorus Compounds* (1950), pp. 143, 155, and 156. Petrov, *Chemical Abstracts*, Vol. 54 (1960), col. 260.

Pikl	2,328,358	Aug. 31, 1943
Bersworth	2,841,611	July 1, 1958
Irani	3,234,124	Feb. 8, 1966 (filed Oct. 18, 1962)

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Petrov, the primary reference, discloses amino tri (methylenephosphonic) acid, a specific form of which is being claimed here. This reference, which is acknowledged in appellant's specification, also sets forth a procedure for preparing ATMP and describes the product as a "glassy solid" (emphasis added). "Glassy" we take to mean like glass and glass is an amorphous, i.e., non-crystalline, material.

The Kosolapoff and Bersworth references are relied on "as showing crystalline amino phosphonic acids," and Pikl and Bersworth as showing "the use of amino substituted phosphonic acids as softeners, sequesterants or chelating agents * * *." Irani, which is not prior art with respect to appellant's application, is cited as showing that "little modification of the [***3] Petrov * * * process will produce a crystalline material * * *."

Claim 1 was rejected by the examiner "as obvious under 35 U.S.C. 103 over Petrov et al who disclose amino-tri (methylenephosphonic acid) which is considered to suggest the instantly claimed material * * *." Notwithstanding that the examiner, and the board, referred only to Petrov in stating this rejection, it is abundantly clear that significant reliance was and is placed on the Kosolapoff, Pikl, and Bersworth references. Appellants, however, do not now complain of this and we will therefore consider the rejection as applied rather than as stated.

The examiner was of the opinion that one skilled in the art knowing of Petrov's "glassy solid" form of ATMP would be motivated to attempt the preparation of crystalline anhydrous ATMP by the knowledge that some amino phosphonic acids exist in crystalline form (Kosolapoff and Bersworth) and that some amino phosphonic acids are useful as softeners, sequesterants, or chelating agents (Pikl and Bersworth).

Purporting to place less reliance on the secondary references than did the examiner, the board stated:

Despite the fact that the Examiner has referred to three additional [***4] patents and one additional publication, the essential point is the obviousness of the "crystalline anhydrous" form of the claimed compound in view of the Petrov et al. disclosure of "a glassy solid" form of the same compound. As we view the comparative properties in Table 1 * * * of appellants' specification, * * * the general indication is that the Petrov et al. material is an impure form of [*1111] amino tri (methylenephosphonic acid). The amorphous appearance, the broad range of melting point, the reduced titration, and the diminished sequestering activity all point to an impure state. The relative dissolution rates have little meaning in the absence of [**808] information concerning particle size, and hygroscopicity is frequently

caused by impurities. Color is likewise often the result of impurities. However, we are not convinced that the claimed material is unobvious, inasmuch as it is still a solid product having the same useful property (sequestration) as the Petrov et al. product. It is recognized that Petrov et al. do not refer to sequestration activity, but the property is inherent in the compound whether explicitly described or not. Moreover, the other cited [***5] art would clearly suggest sequestering activity for a compound of this nature.

Appellants may have devised a process which easily and readily results in a crystalline product, although it is evident from Example 1 of Irani (3,234,124) that little modification of the Petrov et al. process will produce a crystalline material, but we are here concerned only with the unobviousness of the claimed product over the prior art product. So far as we can ascertain, the claimed material is no more than a purer form of the Petrov et al. product, with no patentably significant change in properties or utility.

* * * the impurity of the Petrov et al. product would be immediately evident to a chemist of no more than ordinary competence. It is also to be noted that the product here claimed does not exhibit any unexpectedly different characteristics as compared with the impure product.

Appellants point out that Petrov does not suggest that ATMP could exist in any form other than a glassy solid one, does not disclose any physical or chemical properties of his glassy solid product, does not suggest that it was especially impure, nor suggest any utility for it. Citing *In re Lunsford*, 53 CCPA [***6] 986, 357 F.2d 380, 148 USPQ 716 (1966), appellants complain of the board's use of their application for its disclosure of various properties of Petrov's product (since none are disclosed in the prior art), and argue that without knowledge of these properties, the impurity of Petrov's product would not have been evident. It is also contended that "appellants' material is more than a pure form of Petrov's material."

Appellants concede that the other references show that some aminophosphonic acids can exist in crystalline form and that some can be used as sequesterants. They contend, however, that none of the compounds disclosed in these references is so closely related to ATMP that the two would be expected to have similar properties and that a method for making crystalline anhydrous ATMP would not have been obvious from these references. Appellants further urge that the anhydrous character of their product was unexpected and that its degree of utility as a sequesterant of metal ions was unexpected in comparison with that of Petrov's product. n1

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n1 A table in appellants' application compares the following properties of the two products: physical appearance, hygroscopicity, melting point, rate of dissolution in water, "active" concentration, sequestration of calcium ions, ease of purification, and ease of milling.

[***7]

[*1112] For the reasons stated in *Lunsford, supra*, we agree with appellants that the board's use of information which is only to be found in appellants' application was improper. Furthermore, we are not convinced that without this information, "the impurity of the Petrov * * * product would be immediately evident to a chemist of no more than ordinary competence." Moreover, and regardless of whether this would be evident, we are not convinced that the references of record would lead one of ordinary skill in the art to expect that ATMP would exist in a crystalline, anhydrous form or, assuming such an expectation, that the references would render obvious a method by which such ATMP could be produced. n2 To support the first of these conclusions, the Patent Office relies on the following generalization by Kosolapoff:

n2 Cf. *In re Cofer*, 53 CCPA 830, 354, F.2d 664, 148 USPQ 268 (1966).

Primary and secondary phosphonic acids are, as a rule, crystalline substances [*809] that have, respectively, dibasic [***8] and monobasic functions.

This reference goes on to disclose a number of amino alkylphosphonic acids and their properties. However, all have only one alkylphosphonic acid radical on the nitrogen atom (compared with three in ATMP), the most similar to ATMP being amino methylphosphonic acid ("AMP"). Kosolapoff reports that AMP has, inter alia, the following properties: "Crystals, m. over 300 degrees (from water); only moderately soluble in cold water."

Pikl also discloses that AMP can be obtained as crystals. As stated above, Bersworth is relied on to show that some amino phosphonic acids are crystalline. This reference, however, is concerned with "N-alkyl-substituted-alkylene polyamine methylene phosphonic acids" which are markedly different in structure from ATMP. In any event, the four phosphonic acids for which Bersworth reports physical properties were described, respectively, as "partly crystalline," "crystalline," "syrupy," and "waxy solid." Certainly such a disclosure would not provide a basis for predicting with reasonable certainty that ATMP could exist in a crystalline anhydrous form.

Appellants also cited two publications in the Patent Office to show that [***9] crystalline, anhydrous ATMP could not have been predicted from what was known in the prior art. Freedman and Doak, *Chemical Reviews*, Vol. 57, No. 3, p. 484 (1957), outline various methods of synthesizing aminoalkylphosphonic acids and with reference to products obtained with one such method state:

The free aminophosphonic acids * * * are colorless, high-melting substances which crystallize from water with one or two molecules of solvent of crystallization. [Emphasis added.] n3

n3 It should be noted that appellants are claiming "crystalline anhydrous" ATMP.

[*1113] Fields, *Journal of American Chemical Society*, Vol. 74, pp. 1528-1531 (1952), which also discusses methods of preparing substituted amino-phosphonic acids states:

It was difficult to obtain the free amino-phosphonic acids in pure form. Generally, non-crystallizing hygroscopic sirups resulted. [Emphasis added.]

Upon due consideration of all these reference disclosures concerning the physical forms in which various known amino-phosphonic [***10] acids exist, we think the most definite conclusion that can be reached is that some of these acids can be obtained in crystalline form and some cannot, and that of the former group some can be obtained with ease by conventional procedures and some only with great difficulty by specially devised techniques. This being the case, we cannot conclude that it would have been obvious that crystalline, anhydrous ATMP could exist.

[1] As stated above, even assuming that one skilled in the art could have predicted with reasonable certainty that crystalline anhydrous ATMP could be produced, we are not convinced by this record that it would also have been obvious how this could be achieved. We note that neither the examiner nor the board has contended that a suitable process would have been obvious. The closest that either has come to such a contention is the examiner's statement, based on the disclosure in the Irani patent, that, as it turns out, "little modification of the Petrov * * * process will produce a crystalline material * * *." Obviousness, however, must not be judged by hindsight, and a "little modification" can be a most unobvious one.

In view of the foregoing we need not [***11] consider appellants' arguments regarding the differences in properties between appellants and Petrov's forms of ATMP (supra, note 1).

The decision of the board is reversed.

